

REMARKS
Status of the Application

In the Office Action, Claims 16-20 were rejected. In the present Response, claim 16 has been amended and claims 21-27 have been added so that claims 16-27 are pending.

Claim 16 is being amended to more clearly indicate that a process for producing a solid sheet comprising heating and applying pressure to 1) a multilayer sheet structure comprising at least one sheet layer comprising a nonwoven fabric of short high tensile modulus fibers and at least one other sheet layer comprising a thermoplastic polymer having a low moisture absorption, and 2) at least one metal sheet layer is being claimed. Claim 16 has also been amended to more clearly state that an effective amount of voids between the high tensile modulus fibers are being filled by the thermoplastic polymer so that the solid sheet being produced has an apparent density that is at least about 75% of the calculated density. The amendments to claim 16 are being made for reasons unrelated to patentability. Support for these amendments can be found at page 7, lines 1-21 and lines 29-30, page 8, lines 15-24, page 11, lines 8-21, page 14, lines 31-34, page 15, lines 1-8, and in the claims as originally filed.

Support for newly added claim 22 can be found at page 7, line 31 to page 8, line 14 and in the originally filed claims.

Support for newly added claim 23 can be found at page 14, line 24-30 and in the originally filed claims.

Support for newly added claims 21, 24 and 25 can be found at page 12, lines 18-20 and in the originally filed claims.

Support for newly added claim 26 can be found at page 14, line 8 and in the originally filed claims.

Support for newly added claim 27 can be found at page 15, line 4 to page 16, line 12, and in the originally filed claims.

No new matter has been added.

Oath/Declaration

Applicants accessed Public Pair in search of information unrelated to the present Office Action, and discovered that a Notice of Informal Application was mailed on April 2, 2004. Applicants, however, respectfully assert that the Notice was never received. The Notice further indicates that "the period within to correct the informalities noted below and avoid abandonment is set in the accompanying Office Action." Applicants, however, respectfully assert that the first Office Action was not issued until May 13, 2004, and are puzzled as to what Office Action the Notice is referring. Regardless, Applicants are now taking the opportunity to respond to the Notice.

With regard to the Notice, Applicants respectfully assert that the declaration submitted on December 15, 2003 is not defective because the present application is a divisional of prior nonprovisional Patent Application No. 10/227,997, filed August 26, 2002; the declaration at issue is a copy of the declaration previously submitted in the prior nonprovisional application; the declaration at issue was filed on the same day the present divisional application was filed; and the declaration at issue complied with paragraphs a) through c) of 37 CFR § 1.63.

Indeed, 37 CFR § 1.63(d)(1) expressly indicates that

A newly executed oath or declaration is not required under § 1.51(b)(2) and § 1.53(f) in a continuation or divisional, provided that:

- (i) The prior nonprovisional application contained an oath or declaration as prescribed by paragraphs (a) through (c) of this section;
- (ii) The continuation or divisional application was filed by all or by fewer than all of the inventors named in the prior application;
- (iii) The specification and drawings filed in the continuation or divisional application contain no matter that would have been new matter in the prior application; and
- (iv) A copy of the executed oath or declaration filed in the prior application, showing the signature or an indication thereon that it was signed, is submitted for the continuation or divisional application.

Moreover, Section 602.05(a) of the MPEP indicates that “[a] copy of the oath or declaration from a prior application may be submitted with a continuation or divisional application even if the oath or declaration identifies the application number of the prior application.”

As the declaration at issue comports with the requirements of 37 CFR § 1.63(d)(1) and MPEP Section 602.05(a), Applicants respectfully assert that the declaration at issue is NOT defective, and therefore a new declaration does Not have to be executed and submitted. Accordingly, Applicants respectfully request that the Office expressly recognize that the declaration at issue is NOT defective.

Rejections Under 35 U.S.C. § 112, second paragraph

Claim 16 was rejected under 35 U.S.C. § 112, second paragraph, as purportedly “being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.”

The Examiner asserts that claim 16 “is structurally indefinite, as to what a ‘solid first sheet material’ is made of?” Specifically, the Examiner inquires as to whether the sheet is “made (or comprised of) from the ‘at least one second sheet’ or ‘at least one third sheet?’” The Examiner also asserts that “it is unclear as to whether the second sheet and the third sheet are the same material?” Finally, the Examiner asserts that the “phrase ‘said liquid crystalline polymer’ lacks antecedent basis; at the last line of claim 16 ‘t’ is believed as an error.”

Applicants respectfully assert that in light of the amendments made to the claims, the Examiner’s concerns have been addressed thereby rendering this rejection moot. Accordingly, Applicants respectfully request that the Examiner withdraw this rejection.

Rejections Under 35 U.S.C. § 102/103

Claims 16-20 stand rejected under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,124,004 to Furuta.

The Examiner asserts that “Furuta discloses a laminate comprised of a liquid crystal polyester resin composition and a layer of fiber material.” The

Examiner claims that the “fiber material can be an organic fiber material such as an aramid fiber which can be a non-woven fabric”. The Examiner asserts that the “fiber material is impregnated into the crystal polyester resin composition to form the laminate.”

The Examiner also asserts that column 14, lines 14-17 of Furuta discloses that a “metallic foil can be laminated onto the laminate”, and at column 12, lines 30-37 that the “metallic foil and the fiber reinforced liquid crystal polyester are heat press bonded by heat roll and pressing machine to obtain a laminate.” The Examiner further asserts that Furuta discloses at column 1, lines 15-21 that the “laminate with a metallic foil is particularly useful as circuit board”.

The Examiner also claims that Furuta discloses at column 2, lines 36-39 that his “laminate has a low relative dielectric constant, low dielectric loss constant and low water absorption properties”.

The Examiner, however, correctly noted that “Furuta is silent about the apparent density”, but asserts that “[i]n view of the prior art teaching, it would have been obvious to a skill[ed] artisan to fabricate a prepeg that has a desired density because the density can be controlled by [] choosing the type of liquid crystalline polymer and its viscosity, and also by temperature and pressure applied to the prepeg.”

102(b) Rejection

Applicants, however, respectfully assert that the claimed invention is novel over Furuta because Furuta fails to either expressly or inherently disclose a laminate that has an apparent density that is at least about 75% of the calculated density. As the Examiner expressly acknowledges that Furuta fails to expressly disclose the apparent density limitation, Applicants are left to assume that the Examiner is asserting that such a limitation is inherently present in Furuta.

Applicants, however respectfully assert that the Examiner has failed to provide rationale or evidence that tends to show that the laminates of Furuta inherently possess an apparent density that is at least about 75% of the calculated density. Indeed, Section 2112, paragraph IV of the MPEP indicates

that the Examiner must provide rationale or evidence tending to show inherency. Specifically, Section 2112, paragraph IV indicates that

“[t]o establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’”

Paragraph IV further indicates that “the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” In fact, paragraph IV indicates that “[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.”

In direct contravention of the MPEP, however, the Examiner is in fact simply asserting that the apparent density limitation may occur or be present, and has incontestably failed to provide the necessary fact or technical reasoning needed to reasonably support the assertion that the laminates of Furuta necessarily have an apparent density that is at least about 75% of the calculated density. Instead, the Examiner simply relies on the statement that “[i]n view of the prior art teaching, it would have been obvious to a skill[ed] artisan to fabricate a prepeg that has a desired density because the density can be controlled by [] choosing the type of liquid crystalline polymer and its viscosity, and also by temperature and pressure applied to the prepeg” to carry the day. Such a bald assertion, however, does not rise to the necessary fact or technical reasoning needed to support an assertion of inherency.

As the Examiner bears the burden of providing the necessary fact or technical reasoning to support the asserted inherency, and no such fact or technical reasoning has been provided, Applicants respectfully assert that the apparent density being claimed is not inherently disclosed by Furuta.

Accordingly, Applicants respectfully request that the Examiner withdraw this rejection.

103 Rejection

Applicants respectfully assert that the Examiner has failed to establish a *prima facie* case of obviousness because all of the limitations of the claimed invention have not been taught or suggested by Furuta. Indeed, as already pointed out hereinabove Furuta is devoid of a single disclosure that teaches or even suggests the apparent density limitation of Applicants' claimed invention.

Moreover, Applicants respectfully assert that Furuta fails to disclose the "short high tensile modulus fibers" limitation of the nonwoven fabric of Applicants' claimed invention.

Furthermore, Applicants respectfully assert that Furuta fails to teach or suggest the "LCP fills an effective amount of voids between the HTMFs so that said solid sheet has an apparent density that is at least about 75% of the calculated density" limitation of claims 21 and 25.

Specifically, Applicants direct the Examiner's attention to column 12, lines 50-53, wherein Furuta expressly states that the "fiber material used in the present invention generally has role to reinforce strength of a film or laminate, and an inorganic fiber material or an organic fiber material can be used." Applicants further direct the Examiner's attention to column 12, lines 59-61, wherein LCP is identified as an example of the organic fiber material that can be used, and column 13, lines 6-11, wherein Furuta expressly states that "such a fiber material can be used without any treatment as a constituent component, however, such a fiber material can also be impregnated with a thermosetting resin such as an epoxy resin, phenol resin, polyester resin, acrylic resin, polyimide resin, bismaleimide triazine resin and the like, and used as a prepreg." A prepreg is routinely formed by impregnating a fiber material with a polymer, and therefore a person of ordinary skill in the art would understand that the prepreg of Furuta is being produced by impregnating the fiber material with the thermosetting resin. As a result, any voids that exist in the fiber material of Furuta are being filled by a thermoset resin—and NOT by a thermoplastic LCP.

Moreover, Furuta fails to indicate that prior to being impregnated with the thermosetting resin, the organic LCP fiber material has an apparent density that is at least about 75% of the calculated density. In fact, the prepeg formed after the LCP fiber material is impregnated and cured will presumably be totally solid and have an apparent density that is very close if not equal to the calculated density.

In the alternative, Furuta indicates at column 13, lines 41-44 that "a method can also be used in which the liquid crystal polyester resin composition is melt-extruded through a T die onto the fiber material layer, then they are press-bonded by roll and the like." Despite a long discussion of press bonding and/or laminating at col. 13, line 66 to col. 15, line 4, Furuta is devoid of a single disclosure that teaches or suggests the press-bonding/laminating causes the LCP to fill in an effective amount of voids between the fibers so that a solid sheet having an apparent density that is at least about 75% of the calculated density will be produced.

As Furuta does not disclose ALL of the limitations of Applicants' claimed invention, Applicants respectfully assert that the Examiner has failed to establish a *prima facie* case of obviousness. Accordingly, Applicants respectfully request that the Examiner withdraw this rejection.

Summary

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. In order to expedite disposition of this case, the Examiner is invited to contact Applicants' representative at the telephone number below to resolve any remaining issues. Should there be a fee due which is not accounted for, please charge such fee to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company).

Respectfully Submitted,

By: 

Jacqueline M. Cohen
Attorney For Applicants
Registration No. 51,574
Telephone: (302) 984-6089
Facsimile: (302) 658-1192

DATED: September 13, 2004